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Preliminary Report of Colony Survivorship in the Western Harvetser Ant (*Pogonomyrmex occidentalis*) in Western Nebraska

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PRELIMINARY REPORT OF COLONY SURVIVORSHIP IN THE WESTERN HARVESTER ANT (*POGONOMYRMEX OCCIDENTALIS*) IN WESTERN NEBRASKA.—Colonies of *Pogonomyrmex occidentalis* Cresson (Hymenoptera: Formicidae) may live an average of 22 to 43 years. The population dynamics of individual colonies of *P. occidentalis* adjacent to the Univ. Nebraska's Cedar Point Biol. Sta., Keith Co., Nebraska, is the subject of an ongoing investigation. The habitat is a moderately grazed shortgrass prairie dominated by *Bouteloua hirsuta, B. gracilis,* and *Buchloe dactyloides,* with *Stipa comata, Aristida* spp., and various forbs. The colonies studied are in a triangular area about 400 m long and 100 m across at the widest point. The area appears to be at carrying capacity for *P. occidentalis* colonies: distances between colonies are not large and are quite uniform ($\bar{X}$ = 14.5 m, SE = 0.8 m for 48 colonies, E. Routman, unpubl.)

In July 1981, there were 75 marked colonies in the study area, 57 of which had been followed since August 1977. Of the original 57 colonies, 52 were still alive. One colony died in each of 1978, 1979, and 1981, two in 1980. This is an average death rate of 0.023 colonies per year.

Ten additional colonies were marked in 1978. All but one of these (which died in 1980) was alive in 1981. For this group the death rate is 0.025 colonies per year. All nine colonies added to the study since 1978 were still alive in 1981.

Estimating recruitment to the population is more difficult than estimating mortality. In the first years of the study, it was impossible to be certain that a "new" colony had not been overlooked the previous year. It is still impossible to be sure newly-established colonies are discovered in their first year. Nine colonies were found for the first time in 1979-1981: four, three, and two, respectively. This provides an estimated recruitment rate of 0.045 colonies per year. This rate is significantly higher than the estimated death rate (d.f. = 5, $t = 2.49$, $0.05 > P > 0.025$).

Projecting the death rate estimate (0.023 colonies per year) onto an equilibrium population, colonies would have a mean lifespan of 43 years. From the recruitment rate (0.045 colonies per year), the estimated average lifespan in an equilibrium population is 22 years. The estimates of lifespan assume that the population is neither growing nor declining. This view is supported by the 5 years of data for the site and the uniformity of the size and spacing of individuals in the population (unpubl. notes).

Wilson (*The Insect Societies*, Belknap Press, Cambridge, 1971), reviewing longevities of established ant colonies, reported maximum lifespans of more than 25, 56, and 60 years for *Formica ulkei*, *F. pratensis*, and *F. rufa*, respectively. As he noted, these *Formica* colonies were potentially immortal since new queens are recruited into the colonies. Although *P. occidentalis* has not been reported to be other than a single-queen colony type, the lifespans of their colonies in western Nebraska appear to be similar to those reported for other ant species.

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